

Science 9 Properties of Matter - Review

Name: Key

Block: _____

**** For questions which involve calculations, show all work, including the equation you used (full marks will NOT be given for showing only the final answer) ****

Given information: density = mass/volume

$$D = m/V$$

1. State whether each of the following is matter or energy.

- a. pencil
b. blue paint
c. sunlight
d. the sound of a train
e. oxygen

Matter
Matter
energy
energy
Matter

2. What is matter? (give the two defining characteristics)

Anything with mass and volume

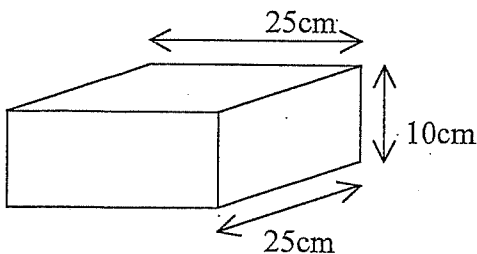
3. A 5000.0 mL container has a mass of 10 000g. What is the density of the container?

$$D = \frac{10\,000\text{g}}{5000\text{mL}} = 2\text{g/mL}$$

4. A block of copper has a mass of 4000g. The block has a volume of 446.9mL. What is the density of copper?

$$D = \frac{4000\text{g}}{446.9\text{mL}} \approx 8.95 \approx 9\text{g/mL}$$

5. Silver has a density of 10.5 g/mL. What is the mass of a block of silver that measures 25cm by 25 cm by 10 cm?



$$D = \frac{m}{V}$$

$$V = 10 \times 25 \times 25 = 6250\text{cm}^3$$

$$10.5\frac{\text{g}}{\text{mL}} = \frac{m}{6250\text{cm}^3}$$

$$m = (10.5)(6250)$$

$$m = 65625\text{g}$$

6. The following materials are all dumped into the same container:

| Material | Density |
|----------|------------|
| Methanol | 0.79 g/mL |
| Mercury | 13.6 g/mL |
| Iodine | 7.86 g/mL |
| Bromine | 3.12 g/mL |
| Lead | 11.34 g/mL |

| |
|----------|
| methanol |
| bromine |
| iodine |
| lead |
| mercury |

In the space provided to the right, list the names of the material in the order that they would settle in the container.

7. A particular rock has mass of 350g. It was placed in a graduated cylinder that had 90.0 mL of water in it and the water in the cylinder rose to 125 mL. What is the density of the rock?

$$D = \frac{m}{V} \quad m = 350g \quad V = 125 - 90 = 35ml$$

$$D = \frac{350g}{35ml} = 10g/mL$$

8. What is the volume of a 40.0g lump of gold? (density of gold is 19.3 g/mL)

$$\frac{19.3g}{mL} = \frac{40.0g}{V} \quad V = \frac{40}{19.3} = 2.07 mL$$

9. A scientist found a bottle of clear liquid in her lab, but the label had fallen off the bottle. She made a number of measurements to try to determine the identity of the liquid. Use the data below, and the table of densities given, to determine the identity of the liquid.

| | |
|--|-----------|
| Volume of liquid | = 10.0 mL |
| Mass of dry 10 mL graduated cylinder | = 11.5 g |
| Mass of graduated cylinder with 10mL of the unknown liquid | = 24.1 g |

Table of densities of some colourless liquids:

| Liquid | density |
|-------------------|-----------|
| Ethanol | 0.70 g/mL |
| Glycerine | 1.26 g/mL |
| Hydrogen peroxide | 1.45 g/mL |
| Methanol | 0.79 g/mL |
| Propanol | 0.79 g/mL |
| Water | 1.00 g/mL |

$$V = 10.0 mL$$

$$m = 24.1 - 11.5$$

$$= 12.6g$$

$$D = \frac{12.6}{10} = 1.26g/mL$$